REMARKS

Favorable reconsideration of this application is requested in view of the above amendments and the following remarks. Claims 1-18 and 20-22 remain pending. In claims 1 and 22 the term "locations" has been clarified.

The Office Action included an objection to the title. This appears to have been repeated inadvertently from the previous Office Action, as a new title was provided in the previous Amendment. Applicants courteously invite the Examiner's suggestion for a title if the new title in fact was not considered suitable.

The Office Action included an objection to claim 5. This also appears to have been repeated inadvertently from the previous Office Action, as claim 5 was amended as requested in the previous Amendment. The objection should be withdrawn.

Claims 1 and 22 were rejected as indefinite. Editorial revisions have been made to clarify that the term defining the presence of the surface layer is not referring to the previously-recited random locations in the thickness direction. Therefore, the rejection should be withdrawn.

Claims 1-18 and 20-22 were rejected as unpatentable over Bailey in view of Hedblom. Applicants respectfully traverse the rejection. For purposes of this response only, the discussion will focus on independent claim 1, with the issues raised in favor of claim 1 applying equally to independent claim 22. Applicants are not conceding that claim 22 does not support additional arguments.

Applicants respectfully contend that the rejection relies on an erroneous interpretation of the references. The rejection interprets Bailey as teaching the first glass sphere group that provides reflective performance at a small observation angle and up to a large incidence angle and a second glass sphere group that provides reflective performance at a larger observation angle and up to a large incidence angle. Applicants respectfully disagree. In Bailey, all of the spheres are embedded in the surface layer (element 10a in the figures) to a depth less than half the average diameter of the spheres by application of heat and pressure (col. 2, lines 5-8). The spheres are embedded with the extreme edges of the non-embedded portions aligned in a common plane (col. 2, lines 16-20 and col. 4, lines 52-57). A spacing layer, which can be considered to correspond to the focusing layer of claim 1 (element 19c) is applied to the surface layer with protruding spheres. As seen at col. 2, lines 42-62, the purpose of the reference is to

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make the spacing layer uniform. Therefore, there is no reasonable basis to assume that Bailey includes the second sphere group required by claim 1, which provides reflective performance at a larger observation angle and up to a large incidence angle and for which the focusing layer is required to be thinner at the glass spheres than a focus formation position for the glass spheres.

The rejection's reliance on Fig. 7's curve A in Bailey as showing the presence of a second group of spheres that provides reflective performance at a larger observation angle and up to a large incidence angle is erroneous. Page 4,lines 10-15 of the Office Action seem to suggest that Fig. 7's curve A illustrates the presence of a first sphere group with reflective performance at a small observation angle of 0 to 20 degrees, and a second group that provides reflective performance at a larger observation angle from 20 to 50 degrees. However, each of the four curves in Fig. 7 shows the change in reflectivity with change in the angle of incidence (col. 4, lines 10-13, col. 6, lines 6-13 and col. 10, lines 34-49). The observation angle ("divergence angle" is the term used by Bailey) is constant for each of the four curves in Fig. 7. As noted at col. 6, line 8 of the reference, the observation (divergence) angle in fact was 0.2 degrees in the experiments conducted by Bailey. Therefore, curve A at best shows that the particular product tested showed different reflectivity between an angle of incidence of 0 to 20 degrees and one of 20 to 50 degrees. Neither curve A nor any other aspect of Fig. 7 of Bailey provides anything to demonstrate the presence of a second group of spheres that provides reflective performance at a larger observation angle and up to a large incidence angle. To illustrate this point further, note that while Bailey shows results only at an observation angle of 0.2 degrees as discussed above, Figs 2-4 of the present application show reflectivity properties with changing angle of incidence at observation angles of 0.2, 2 and 4 degrees respectively.

Contrary to the assertion at the end of page 9 of the Office Action, Applicants respectfully contend that the present specification provides more than adequate guidance as to the nature of the angles contemplated in claim 1. For example, paragraph [0004] indicates that various standards in use around the world require only a maximum of 2 degrees for an observation angle and a maximum of 50 degrees for the incidence angle for evaluating reflective materials. See also paragraphs [0094] and [0137], which indicate that the small observation angle is one of 2 degrees or less as defined in the standards, while a larger observation angle is greater than 2 degrees, and a large incidence angle is one greater than 50 degrees. See also the discussion of the two groups of spheres and the respective angles at paragraph [0059].

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In addition, the sentence bridging pages 9-10 of the Office Action contends that bailey Fig. 3 shows a thinner focusing layer 10a for larger spheres. This too is erroneous. Element 10a is the surface layer in Bailey. Element 19c is the focusing layer, and has a uniform thickness regardless of the size of the sphere. As discussed above, the uniform thickness is one of the specific objectives disclosed by Bailey.

Therefore, the rejection relies on a misinterpretation of Bailey and should be withdrawn for this reason alone. However, the rejection's interpretation of Hedblom also is incorrect.

The rejection contends that Bailey and Hedblom are related as retro-reflector bead systems. While this may be true, Applicants respectfully contend that there are significant practical considerations and differences in underlying theory between various types of reflective systems that preclude the simple interchangeability of parts that the rejection relies on in combining the reference disclosure.

Bailey, like the invention of claim 1, is directed to an enclosed lens system, and in Bailey the spheres are encapsulated by the surface layer 10a and focusing layer 19c as discussed above. On the other hand, Hedblom clearly and unequivocally is directed to an exposed lens retroreflective sheet. See for example line 4 of the Abstract, col. 2, lines 62-64, and col. 4, lines 6-10. That is, in the enclosed lens system, a surface layer is present over the glass spheres, while in the exposed lens system, the glass spheres are exposed to the outside.

The significance of this is illustrated by the Hedblom reference itself. In an exposed lens system, the surface of the glass spheres will become wet when it rains, and this affects the reflection performance. Hedblom specifically is concerned with improving the reflection performance of the exposed lens system in wet conditions. See for example col. 1, lines 21-34, col. 2, lines 47-51 and 54-58, and col. 6, lines 39-44. In an enclosed lens system, the glass spheres are not exposed to the atmosphere. Even in wet conditions, it is the surface layer that becomes wet, not the glass spheres, and the reflective performance of the glass spheres is not affected by the wet conditions. Thus, the teachings of Hedblom on how to improve the performance of the exposed lens system product in wet conditions would be recognized as having no relevance to an enclosed lens system such as that of Bailey.

This is not contradicted by the teachings at col. 2, lines 65-67 of Hedblom that additional layers may be present, which page 5 of the Office Action cites as supporting the combination of references. This portion of the reference may indeed disclose that there may be multiple layers,

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but this is referring to the structure that supports the exposed glass spheres. Col. 2, lines 65-67 specifically refer to one or more "top layers". As discussed at col. 3, line 34 and seen in Fig. 2, Hedblom's "top layer 22" in fact is the part of the product by which the glass spheres, spacing layer and reflective layer can be adhered to a roadway or the like. This in no way teaches that additional layers can be provided on the exposed glass spheres and this portion of Hedblom thus cannot be interpreted as contemplating or suggesting the encapsulation of the spheres.

The rejection also cites Col. 10, line 38-41 as teaching that glass spheres should be disposed at random locations in the thickness direction of the focusing layer. However, Col. 10, lines 38-41 in fact state that "skid-resistant particles are randomly sprinkled ..." (emphasis added). This portion of the reference manifestly has nothing whatsoever to do with the location of the glass spheres.

Moreover, even if Hedblom were to be considered applicable to Bailey, the invention of claims 1 and 22 would not be achieved by combining the teaching of the references when the teachings of Hedblom are considered properly as a whole. Hedblom teaches that to improve the optical performance in wet conditions, the spacing layer should be made thicker. See col. 6, lines 39-44. Thus, in the embodiment of Fig. 4 of Hedblom, the focus layer thickness appropriate for dry conditions is made thicker for some spheres in order to improve the reflective performance for those spheres in wet conditions. This thickening of the focus layer teaches directly away from the requirement of claim 1 that the focusing layer for the second glass sphere group is made thinner at the glass spheres than a focus formation position for the glass spheres.

Claim 2 is even further removed from the references. Claim 2 requires that the second sphere group comprise spheres spaced away from the surface layer. As discussed above, Bailey specifically and intentionally embeds all of his spheres in the surface layer. Even if the rejection were to be correct in asserting that the art of record would suggest the different sphere groups and thinner focus layer of claim 1, to disengage some of Bailey's spheres from the surface layer to meet the requirement of claim 2 would completely and improperly disregard the entire thrust of Bailey's teachings. Applicants are not conceding the relevance of the references to the features of the remaining dependent claims.

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In view of the above, Applicants request reconsideration of the application in the form of a Notice of Allowance.

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